

WHAT IS CLAIMED IS:

1. A method for automatically dynamically adjusting prestressed bearings of a shaft comprising the steps of:
 - a) forming a sleeve assembly comprising an outer sleeve and a first inner sleeve fitted together;
 - b) selecting a thermal expansion coefficient of the outer sleeve larger than that of the first inner sleeve;
 - c) machining surfaces of the outer and the first inner sleeves for making an inner diameter of the outer sleeve smaller than an outer diameter of the first inner sleeve;
 - d) heating the outer sleeve at a predetermined temperature for expanding the inner diameter thereof to be larger than the outer diameter of the first inner sleeve prior to putting the outer sleeve onto the first inner sleeve;
 - e) decreasing temperature of the outer and the first inner sleeves for securing them together; and
 - f) mounting the sleeve assembly onto the shaft prior to sandwiching the sleeve assembly between the bearings, thereby exerting a predetermined prestress on each of the bearings.
2. The method of claim 1, wherein the sleeve assembly further comprises a second inner sleeve fitted within the first inner sleeve, the second inner sleeve having a thermal expansion coefficient larger than that of the first inner sleeve.
3. The method of claim 1, wherein the outer sleeve is formed of a brass.
4. The method of claim 1, wherein the first inner sleeve is formed of an Invar alloy.
5. The method of claim 2, wherein the second inner sleeve is formed of either a brass or ceramic material.
6. An apparatus for automatically dynamically adjusting prestressed bearings

of a shaft comprising a sleeve assembly sandwiched between the bearings and including an outer sleeve and a first inner sleeve fitted together wherein a thermal expansion coefficient of the outer sleeve is larger than that of the first inner sleeve, an inner diameter of the outer sleeve is smaller than an outer diameter of the first inner sleeve, and the outer and the first inner sleeves are secured together in a room temperature for compressing the first inner sleeve to extend axially by the outer sleeve.

7. The apparatus of claim 6, wherein the sleeve assembly further comprises a second inner sleeve fitted within the first inner sleeve, the second inner sleeve having a thermal expansion coefficient larger than that of the first inner sleeve.
8. The apparatus of claim 6, wherein the outer sleeve is formed of a brass.
9. The apparatus of claim 6, wherein the first inner sleeve is formed of an Invar alloy.